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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,359	12/11/2000	Yoshikazu Sano	A33803 PCT	7019

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BAKER & BOTTS
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 10/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/719,359

Applicant(s)

SANO ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 30 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,2 and 4-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-2 and 4-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

1. All outstanding rejections except for those described below are overcome by applicants' amendment filed 7/30/02.

The new grounds of rejection as set forth in paragraphs 3-6 below are necessitated by applicants' amendment and thus, the following action is final.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 1-2, 4-11, and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 55-27373 in view of Dando et al. (U.S. 5,908,914).

Using an English translation of the Japanese reference provided by the applicants, it is noted that JP 55-27373 discloses a process wherein rosin such as wood rosin, tall oil rosin, polymerized rosin, or hydrogenated rosin is reacted with resol phenol resin and polyhydric alcohol. The resol phenol resin is prepared by reacting phenol and formaldehyde in a ratio of 1 mol phenol to 1-4 moles formaldehyde in the presence of a volatile base catalyst such as ammonia or amine at 40-100 °C. Either the rosin is first reacted with resol phenol resin at 150-280 °C followed by reaction with polyhydric alcohol or the rosin is first reacted with polyhydric alcohol followed by reaction with resol phenol resin at 150-280 °C. The process produces a resin which has acid number less than 30, softening point of 130-190 °C, and solubility of 7 times in petroleum hydrocarbon solvent which has boiling point of 240-330 °C and aniline point of 65-

100 °C. The resin is used as a binder in printing ink (claim 1, page 2, lines 18-23, page 4, lines 11-18, page 5, lines 17-19, pages 8, lines 11-20 and 22-23, page 9, lines 6-15 and 17-18, and page 10, lines 8-23). It is noted that while the present claims refer to the resin produced by the process as a phenol modified rosin ester and JP 55-27373 refers to the resin produced by the process as a rosin modified phenolic resin, given that JP 55-27373 discloses process identical to that presently claimed including identical ingredients as well as identical order in which the ingredients are reacted, it is clear that the process of JP 55-27373 would produce the same product as presently claimed.

Although there is no explicit disclosure of the nitrogen residue content resulting from the volatile base catalyst, given that JP 55-27373 discloses amine catalyst identical to that presently claimed so that the catalyst must necessarily also possess the same volatility as the claimed catalyst as well as the same reactivity with phenol-formaldehyde as the claimed catalyst and further given that JP 55-27373 discloses the same process temperatures for reacting phenol with formaldehyde to form the resol phenol resin and for reacting rosin or polyhydric alcohol ester of rosin with resol phenol resin as presently claimed, all of which would affect the amount of residual nitrogen, it is clear that the resin formed by the process of JP 55-27373 would intrinsically possess the same nitrogen residual content as presently claimed.

The difference between JP 55-27373 and the present claimed invention is the requirement in the claims of reacting the phenol and formaldehyde in a closed reactor under increased pressure when forming the resol phenol resin.

Dando et al., which is drawn to phenolic resol resins, disclose that preparing phenol-formaldehyde in a sealed reactor under pressure has several advantages over using an open

reactor such as higher yield resol resin per unit time, lower yields of unreacted starting materials, and shorter cycle times. Further, examples 4-5 show that if the pressure is increased, the cycle time decreases while the resin yield increases (col.2, lines 43-67 and col.14, lines 30-50).

In light of the motivation for reacting phenol and formaldehyde in a closed reactor under increased pressure disclosed by Dando et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to react the phenol and formaldehyde in JP 55-27373 in a closed reactor under increased pressure in order to produce higher yield resol resin per unit time, lower yields of unreacted starting materials, and shorter cycle times, and thereby arrive at the claimed invention.

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 55-27373 in view of Dando et al. as applied to claims 1-2, 4-11, and 13-17 above, and further in view of either JP 7-126338 or DeBlasi et al. (U.S. 4,857,624).

The difference between JP 55-27373 in view of Dando et al. and the present claimed invention is the requirement in the claims of the weight average molecular weight of the phenol modified rosin ester.

JP 7-126388, which is drawn to a process for preparing phenol modified rosin ester suitable for use in inks, disclose that the resin has weight average molecular weight (M_w) of 30,000-250,000 and that if M_w is less than 30,000, the resistance to misting is reduced (claim 1 and page 5, lines 4-7).

Alternatively, DeBlasi et al., which is drawn to phenolic modified rosin ester for printing inks, disclose the use of phenolic modified rosin ester having high M_w , for instance

approximately 80,000 or 200,000 and disclose that using such phenolic modified rosin ester produces inks which exhibit more consistent printing results, improved hold out, and excellent reducibility as well as good gloss and good film forming properties (col.3, lines 20-31, col.4, lines 1-66, and examples 1 and 3).

In light of the motivation for using phenol modified rosin ester with specific M_w disclosed by either JP 7-126338 or DeBlasi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use resin with such M_w in JP 55-27373 in order to produce an ink with good resistance to misting or alternatively, consistent printing results, improved hold out, and excellent reducibility, and thereby arrive at the claimed invention.

5. Claims 1-2, 4-11, and 13-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Oishi et al. (U.S. 4,002,585) in view of Dando et al. (U.S. 5,908,914) and either Lederman et al. (U.S. 3,053,807) or *Encyclopedia of Polymer Science and Engineering*.

Oishi et al. disclose a process wherein rosin such as gum rosin, wood rosin, tall oil rosin, partially polymerized rosin, or hydrogenated rosin is reacted with resol phenol resin and polyhydric alcohol. The resol phenol resin is prepared by reacting phenol and formaldehyde in a ratio of 1 mol phenol to 2 moles formaldehyde in the presence of a base catalyst at 50-100 °C. Either the rosin is first reacted with resol phenol resin at 150-250 °C followed by reaction with polyhydric alcohol or rosin is first reacted with polyhydric alcohol followed by reaction with resol phenol resin at 150-250 °C. The process produces a resin which has acid number of not more than 30, softening point not less than 140 °C, and solubility of 5 times in petroleum hydrocarbon solvent which has boiling point of 276-312 °C and aniline point of 73 °C. The resin

is used as a binder in printing ink (col.2, lines 5-6 and 19-41, col.3, lines 20-46, col.4, lines 48-55, col.5, lines 16-21, 47-49, and 65-68, and example 1).

The difference between Oishi et al. and the present claimed invention is the requirement in the claims of (a) a volatile base catalyst and (b) the requirement in the claims of reacting the phenol and formaldehyde in a closed reactor under increased pressure when forming the resol phenol resin.

With respect to difference (a), Oishi et al. disclose the use of base catalyst such as sodium hydroxide, but there is no disclosure of a volatile base catalyst as presently claimed.

Lederman et al., which is drawn to preparing phenol-formaldehyde resin, disclose using amine catalyst instead of sodium hydroxide catalyst in order to avoid the expense and additional time required for the usual neutralization and washing steps required when sodium hydroxide is employed. Also, by using the amine catalyst, the loss of yield is avoided (col.1, lines 18-35 and 48-54 and col.3, lines 27-49).

Alternatively, *Encyclopedia of Polymer Science and Engineering* (pages 56-57) discloses that special resoles are obtained with amine catalysts, which affect the chemical and physical properties because of the incorporation of the amine into the resole. As compared to resole prepared in the presence of sodium hydroxide, a resole prepared using amine catalyst has higher molecular weight, less free phenol, lower water solubility, and higher glass transition temperature.

Although there is no explicit disclosure in either Lederman et al. or *Encyclopedia of Polymer Science and Engineering* of the nitrogen residue content resulting from the use of volatile amine catalyst, given that either Lederman et al. or *Encyclopedia of Polymer Science and*

Engineering disclose amine catalyst identical to that presently so that the catalyst must also necessarily possess same volatility as the claimed catalyst as well as the same reactivity with phenol-formaldehyde as the claimed catalyst and further given that Oishi et al. disclose same process temperatures for reacting phenol with formaldehyde to form the resol phenol resin and for reacting rosin or polyhydric alcohol ester of rosin with resol phenol resin as presently claimed, all of which would affect the amount of residual catalyst, it is clear that the resin formed by the process of Oishi et al. would intrinsically possess the same nitrogen residual content as presently claimed when using the amine catalyst disclosed by either Lederman et al. or *Encyclopedia of Polymer Science and Engineering*.

In light of the motivation for using volatile amine catalyst disclosed by either Lederman et al. or *Encyclopedia of Polymer Science and Engineering* as described above, it therefore would have been obvious to one of ordinary skill in the art to use this type of catalyst in the process of Oishi et al. in order to inexpensively produce a resin in a shorter amount of time, or alternatively, to produce a resin with suitable molecular weight, solubility, and glass transition temperature, and thereby arrive at the claimed invention.

With respect to difference (b), Dando et al., which is drawn to phenolic resol resins, disclose that preparing phenol-formaldehyde in a sealed reactor under pressure has several advantages over using an open reactor such as higher yield resol resin per unit time, lower yields of unreacted starting materials, and shorter cycle times. Further, examples 4-5 show that if the pressure is increased, the cycle time decreases while the resin yield increases (col.2, lines 43-67 and col.14, lines 30-50).

In light of the motivation for reacting phenol and formaldehyde in a closed reactor under increased pressure disclosed by Dando et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to react the phenol and formaldehyde in Oishi et al. in a closed reactor under increased pressure in order to produce higher yield resol resin per unit time, lower yields of unreacted starting materials, and shorter cycle times, and thereby arrive at the claimed invention.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oishi et al. in view of Dando et al. and either Lederman et al. or *Encyclopedia of Polymer Science and Engineering* as applied to claims 1-2, 4-11, and 13-17 above, and further in view of either JP 7-126338 or DeBlasi et al. (U.S. 4,857,624).

The difference between Oishi et al. in view of Dando et al. and either Lederman et al. or *Encyclopedia of Polymer Science and Engineering* and the present claimed invention is the requirement in the claims of the weight average molecular weight of the phenol modified rosin ester.

JP 7-126388, which is drawn to a process for preparing phenol modified rosin ester suitable for use in inks, disclose that the resin has weight average molecular weight (M_w) of 30,000-250,000 and that if M_w is less than 30,000, the resistance to misting is reduced (claim 1 and page 5, lines 4-7).

Alternatively, DeBlasi et al., which is drawn to phenolic modified rosin ester for printing inks, disclose the use of phenolic modified rosin ester having high M_w , for instance approximately 80,000 or 200,000 and disclose that using such phenolic modified rosin ester

produces inks which exhibit more consistent printing results, improved hold out, and excellent reducibility as well as good gloss and good film forming properties (col.3, lines 20-31, col.4, lines 1-66, and examples 1 and 3).

In light of the motivation for using phenol modified rosin ester with specific M_w disclosed by either JP 7-126338 or DeBlasi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use resin with such M_w in Oishi et al. in order to produce an ink with good resistance to misting or alternatively, consistent printing results, improved hold out, and excellent reducibility, and thereby arrive at the claimed invention.

7. Claims 1-2, 4-8, 10-11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frihart et al. (U.S. 6,022,947) in view of either Lederman et al. (U.S. 3,053,807) or *Encyclopedia of Polymer Science and Engineering*.

The rejection is adequately set forth in paragraph 18 of the office action mailed 1/31/02 and is incorporated here by reference.

Further, it is noted that col.11, lines 58-59 disclose that the reaction between phenol and formaldehyde occurs in the absence of solvent.

8. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frihart et al. in view of either Lederman et al. or *Encyclopedia of Polymer Science and Engineering* as applied to claims 1-2, 4-8, 10-11 and 14 above, and further in view of either JP 7-126338 or DeBlasi et al. (U.S. 4,857,624).

The rejection is adequately set forth in paragraph 19 of the office action mailed 1/31/02 and is incorporated here by reference.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frihart et al. in view of either Lederman et al. or *Encyclopedia of Polymer Science and Engineering* as applied to claims 1-2, 4-8, 10-11 and 14 above, and further in view of Oishi et al. (U.S. 4,002,585).

The rejection is adequately set forth in paragraph 20 of the office action mailed 1/31/02 and is incorporated here by reference.

Response to Arguments

10. Applicants arguments regarding JP 63-86771 have been considered but are moot in view of the discontinuation of this reference as applied against the present claims.

11. Applicants' arguments filed 7/30/02 have been fully considered but, with exception of arguments relating to JP 63-86771, they are not persuasive.

Specifically, applicants' argue that:

(a) JP 55-27373 is no longer a relevant reference against the present claims given that the reference discloses reacting phenol and formaldehyde in the presence of solvent, which is in contrast to the present claims that require that the phenol and formaldehyde react in the absence of solvent.

(b) There is no motivation to combine JP 55-27373 or Oishi et al. with Dando et al. given that Dando et al. do not disclose phenol-modified rosin ester and further disclose reacting phenol

and formaldehyde in the presence of catalytic amount of divalent metal wherein such metal is not required in the present invention.

(c) No disclosure in Frihart et al. of reacting phenol with formaldehyde under increased pressure in the absence of solvent.

With respect to argument (a), it is noted that page 8, lines 16-19 of JP 55-27373 disclose reacting phenol and aldehyde in presence of alkali catalyst at given temperature for a certain time. There is no requirement that the reaction take place in the presence of solvent.

With respect to argument (b), it is noted that Dando et al. is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely that reacting phenol and formaldehyde in a closed reactor under pressure is advantageous, and in combination with the primary reference, discloses the presently claimed invention. If the secondary reference contained all the features of the present claimed invention, it would be identical to the present claimed invention, and there would be no need for secondary references.

Further, while it is agreed that Dando et al. disclose the use of catalytic amount of divalent metal when reacting phenol and formaldehyde, it is noted that the use of such divalent metal is clearly not excluded from the scope of the present claims. That is, it is the examiner's position that the claims are open to the inclusion of other ingredients when reacting phenol and

formaldehyde. While the present claims recite "resol phenol resin which is prepared by reacting phenol with formaldehyde in a closed reactor...in the presence of volatile base catalyst and in the absence of solvent", it is noted that the absence of additional ingredients, such as divalent metal, does not necessarily imply that the scope of the claims does not encompass such agents.

In light of the above, it is the examiner's position that Dando et al. remains a relevant reference against the present claims.

With respect to argument (c), as cited by the examiner in paragraph 18 of the office action mailed 1/31/02, Paper No. 6, col.10, lines 52-53 of Frihart et al. disclose that the phenol and formaldehyde are reacted under elevated pressure. Further, it is noted that col.11, lines 58-59 of Frihart et al. disclose that the reaction occurs in the absence of solvent.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie Shosho
10/9/02


VASU JAGANNATHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700